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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,178	01/09/2004	Ming Huan Tsai	24061.144 (TSMC2003-0250)	8465
42717	7590	07/01/2005	EXAMINER SMITH, BRADLEY	
HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202			ART UNIT 2891	
			PAPER NUMBER	

DATE MAILED: 07/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/754,178	Applicant(s) TSAI ET AL.	
	Examiner Bradley K. Smith	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration:
- 5) ☒ Claim(s) 15-26 is/are allowed.
- 6) ☒ Claim(s) 1,2,6-9 and 13 is/are rejected.
- 7) ☐ Claim(s) 3-5,10-12 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/14/04</u> . | 6) <input checked="" type="checkbox"/> Other: <u>search notes</u> . |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 6-9 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Vahedi et al. (US 2003/0148224). Vahedi et al. disclose forming an anti-reflective coating (ARC) layer (16) above an insulation layer (14) of a substrate; forming a patterned photoresist layer including at least one opening therein above the ARC layer; etching the ARC layer and the insulation layer in a process comprising: introducing a first gas including fluorocarbon gas for etching and polymer formation; introducing a second gas containing oxygen for polymer formation control; and partial etching the ARC layer defined by the at least one opening and subsequently forming a polymer layer on the inside of the at least one opening (see paragraph 0076). With respect to 2, Vahedi et al. disclose repeating the step of partial etching and polymer formation to form the at least one opening in the ARC layer', and continuing the step of partial etching and polymer formation to form the at least one opening in the insulation layer (figure 5). With regards to claim 6, the insulation layer could inherently be an ILD. With regards to claims 7 and 8, Vahedi et al. disclose the use of CxFy and CxHyFz.

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With regards to claim 9 Vahedi et al. disclose the use of oxygen. With regards to claim 13, the insulation layer could inherently be a intermetal dielectric.

Allowable Subject Matter

3. Claims 15-26 are allowed.

4. Claims 3-5, 10-12, and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record neither teaches nor suggests within the context of the entire claim the opening including a contact (claim 3), forming an etch stop layer above the substrate prior to forming the insulation layer (claims 4 and 5), introducing a third gas as diluent and for ion density control (claim 10), the photoresist layer and the ARC layer are subsequently removed such that a conductive layer is subsequently formed in the at least one opening in the insulation layer to electrically contact an active region of a transistor (claim 11), the opening includes a via (claim 12), the photoresist layer and the ARC layer are subsequently removed such that a conductive layer is subsequently formed in the at least one opening in the insulation layer to electrically contact a metal layer formed above the substrate (claim 14) forming a second ARC layer above the insulation layer', forming a second photoresist layer having a second patterned opening

therein', etching the second ARC layer and the insulation layer in a process comprising: introducing the first and second gas; partial etching the second ARC layer defined by the second patterned opening and subsequently forming a polymer layer on the inside of the second patterned opening; repeating the step of partial etching and polymer formation to form the second patterned opening in the second ARC layer', and continuing the step of partial etching and polymer formation to form the second patterned opening in the insulation layer (claims 15-26).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bradley K. Smith whose telephone number is (571) 272-1884. The examiner can normally be reached on 10-6 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Brad Smith', with a stylized, cursive script.

Brad Smith
Primary Examiner
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